Deloitte.

DE FACTS II Software Delivery Methodology

Hybrid-Agile

March 2016

Content

Our Need

Redefining the FACTS II methodology

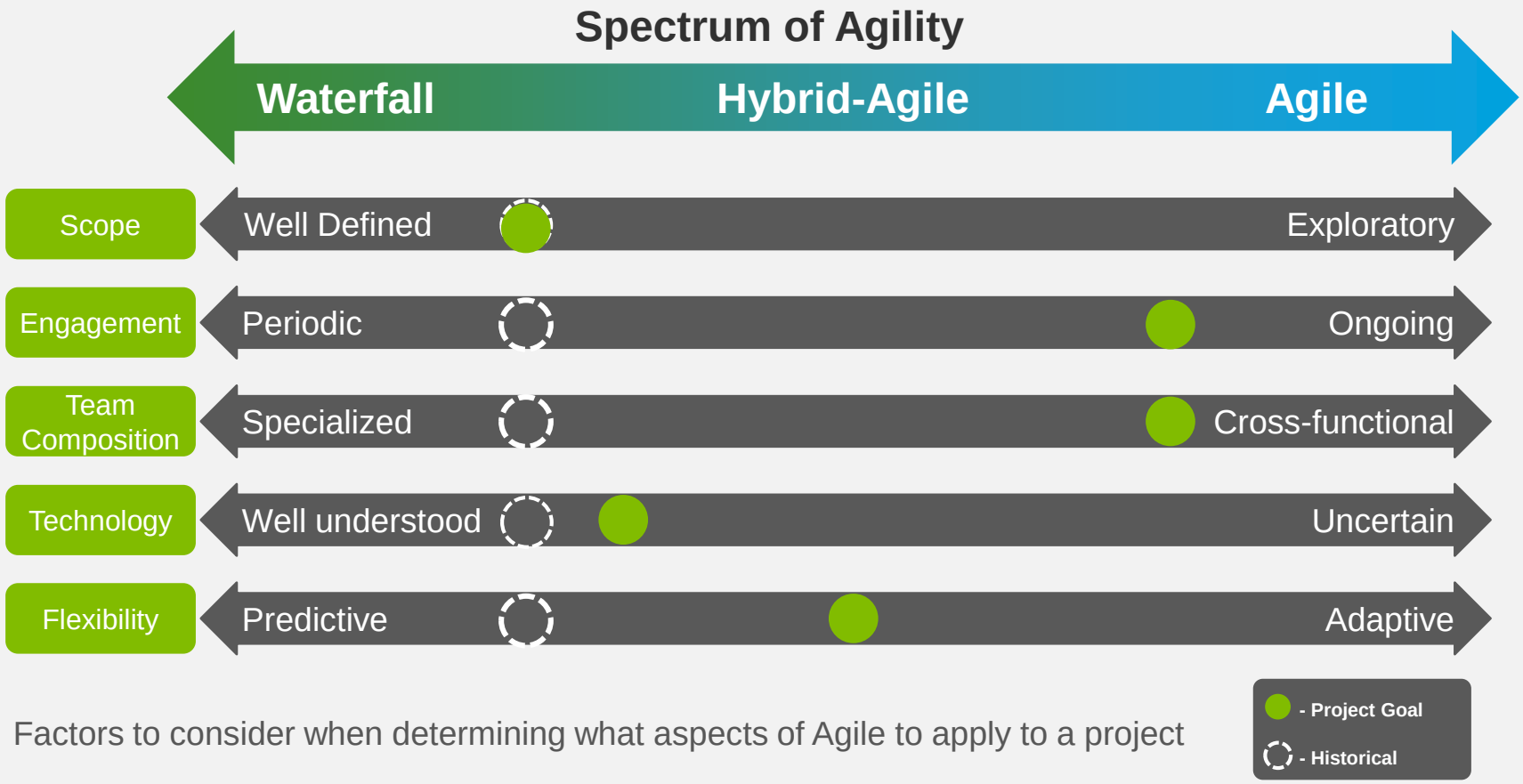
DSCYF and Deloitte see the opportunity to modify the approach of FACTS II delivery methods and incorporate lessons learned from the original FACTS II effort and other Deloitte efforts.

The proposed approach is to align a Hybrid-Agile approach by incorporating Agile practices while keeping within the parameters of typical fixed scope projects.

Hybrid-Agile approach blends Agile concepts with the predictability of defined scope, which is delivered iteratively and with transparency.

FACTS II - Hybrid-Agile Approach

Hybrid-Agile is the application of adaptive, Agile concepts and techniques in a traditional, predictive project. Below is the ideal state for our effort



Factors to consider when determining what aspects of Agile to apply to a project

Hybrid-Agile Framework – Key Characteristics

Our Hybrid-Agile process is a modular, flexible approach which applies Agile techniques to iterative development and test cycles.

Organizing work into feature or process focused sprints within a phase.

Use of a Product Backlog that continuously defines and refines sprint plans.

Defining fixed scope deliverable or tasks in sprint plans with estimated time and resources.

Frequent demonstrations of software to the client and gathering of feedback.

Organizing work into prioritized feature focused sprints

Tracking effort during sprints using a burn down chart to provide visibility and manage trends.

Hybrid-Agile benefits

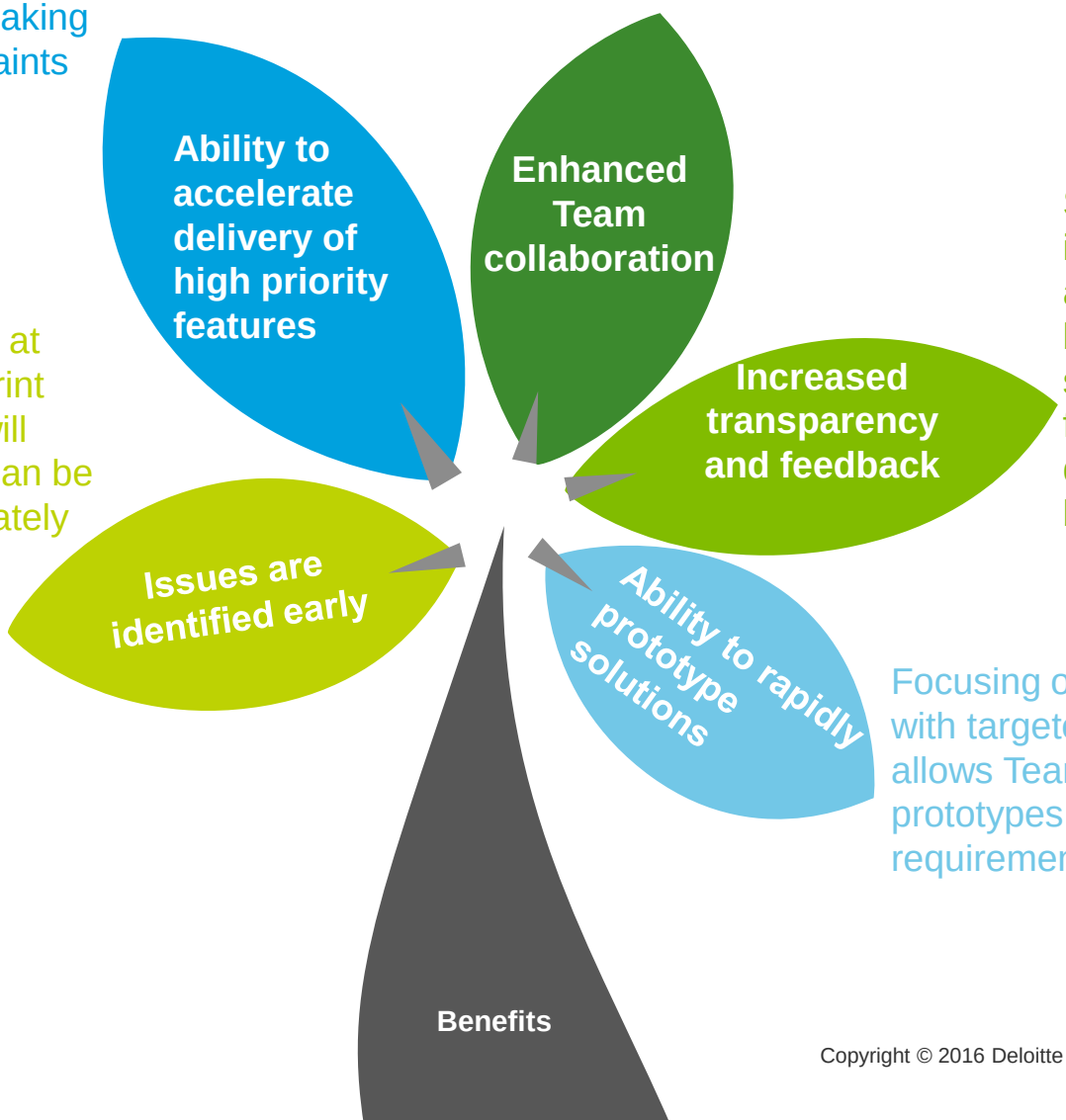
Overall project is executed on a priority basis, taking into account constraints and dependencies.

A process focus brings all groups together and removes silos.

Stakeholders will be involved in every sprint and tangible progress will be reviewed regularly, supporting continuous feedback between development and the business

Consistent reviews at the end of each sprint mean any issues will surface early and can be addressed immediately

Focusing on shorter sprints with targeted functionality allows Teams to develop prototypes to confirm requirements



Success factors

Highly engaged stakeholders
Business representatives and other key stakeholders must be available to the development team to answer questions and provide feedback on a timely and frequent basis.

Persistent, continuous focus on requirements
Requirements priority may be driven by business value, technical dependencies, process dependencies, or impact to other requirements.

New requirements are likely emerge during sprint reviews and should be prioritized against the exiting scope of work, and are subject to change control.

Fixed sprint scope and time-boxed iterations
Once a sprint has started, the scope is frozen. Sprints are strictly time-boxed, and any unfinished work must be reprioritized against the future sprint plans.

Consistency
Using the Hybrid-Agile approach in daily activities requires a disciplined approach to consistently report burn down and manage to sprint plan and goals.

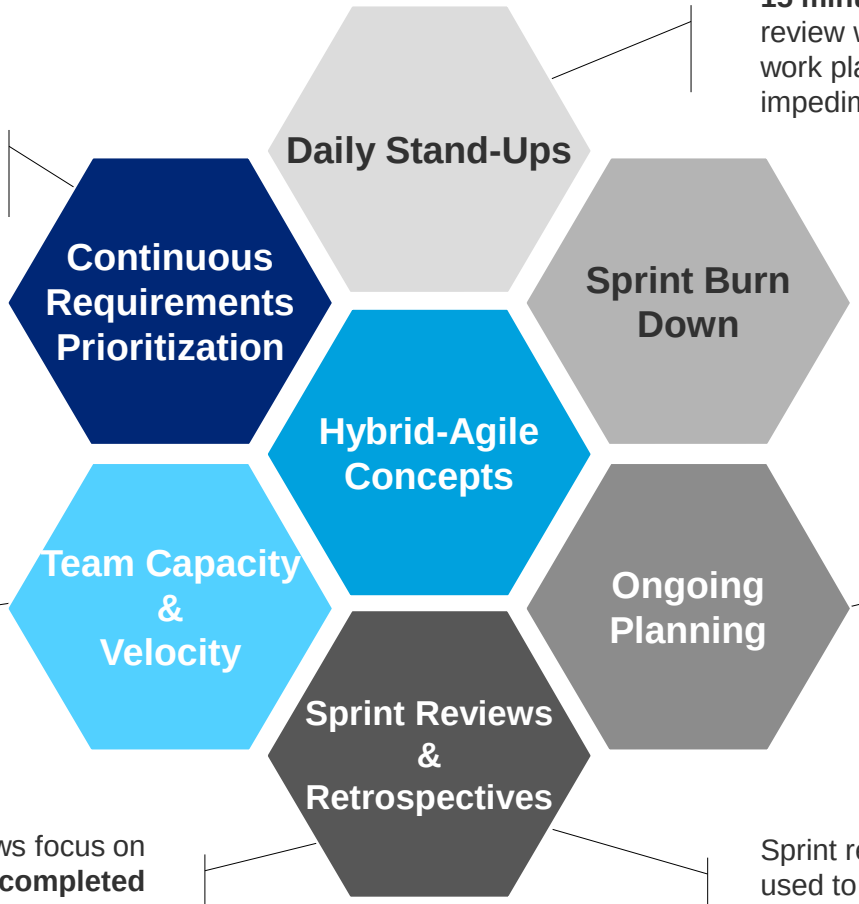
Hybrid-Agile Framework

Application of Agile concepts

Agile concepts typically used in Hybrid-Agile approach include:

Requirements are "force-ranked" so that each has a **unique priority value** (1,2,3, etc.), and priorities may be adjusted as new information becomes available or new requirements emerge from sprint reviews

15 minute time-boxed meetings to review work accomplished the day before, work planned for the current day, and any impediments facing the team



A visual representation which shows the teams' overall progress against the sprint goals

Team capacity = the **amount of hours available** per sprint for work on the sprint deliverables

Team velocity = number of **units of work completed** in a sprint

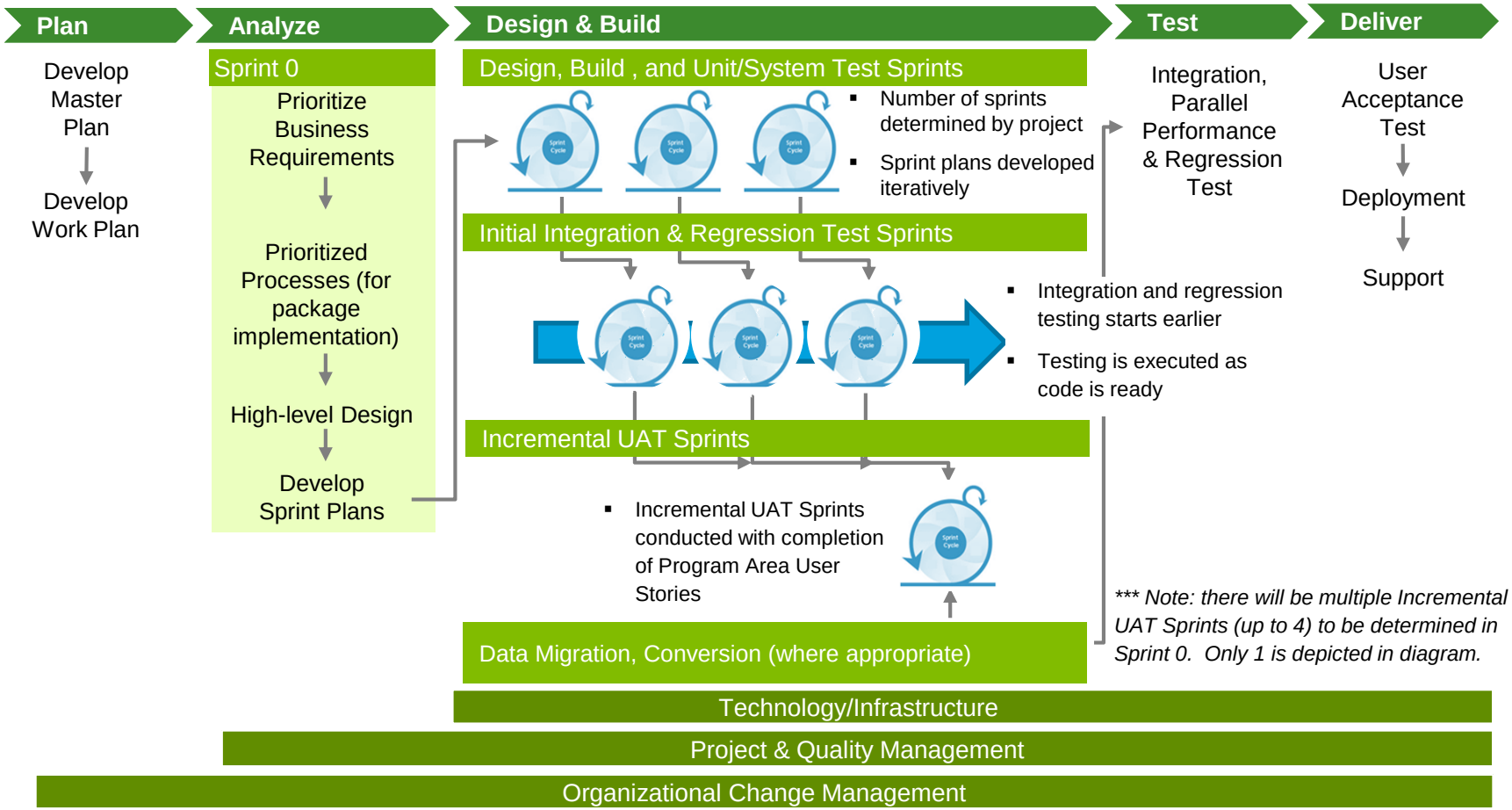
Continuous planning supports **flexibility** in incorporating new requirements or changes in priorities (subject to change control processes)

Sprint reviews focus on **demonstrating work completed** during the sprint and on gathering **feedback** from stakeholders

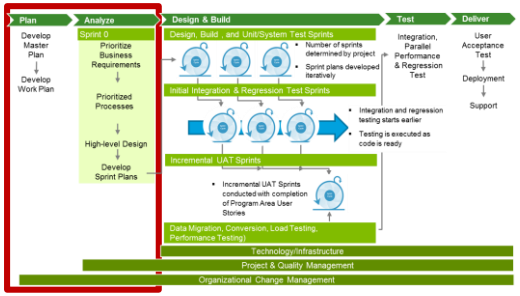
Sprint retrospectives are used to identify **lessons learned** and improvements for future sprints

FACTS II Hybrid-Agile Framework

Design and development work is conducted in **Sprints**, with some testing conducted concurrently. An integrated end-to-end test phase is conducted at the conclusion of sprints and prior to a **Release.**

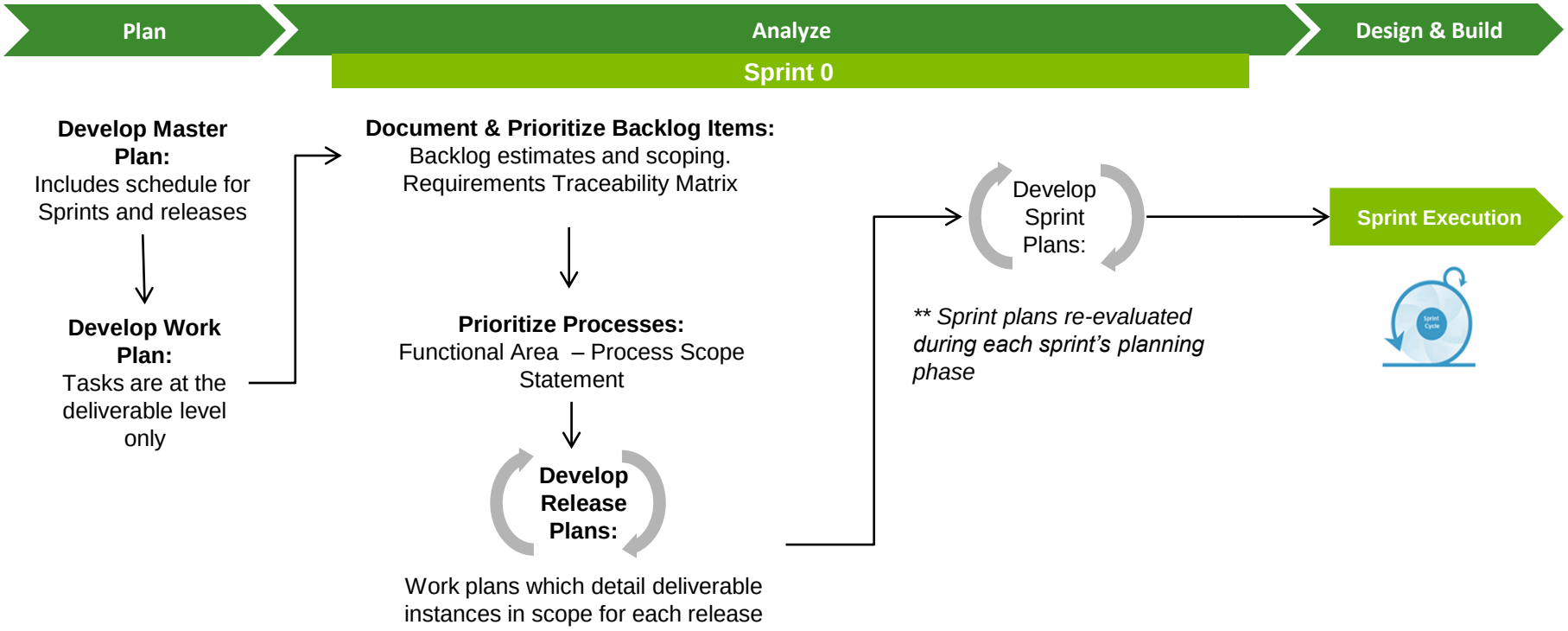


Discovery - Planning and Analysis



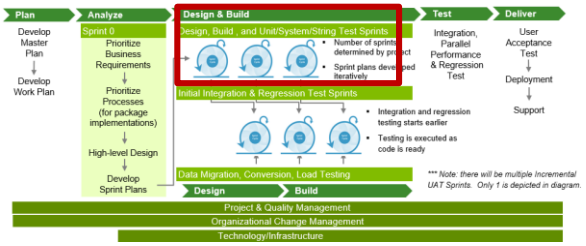
During the planning and analysis, the foundation for the project is cemented. An overarching master plan is created, themes and epics are mapped on a roadmap and the product backlog is created with initial user stories that are prioritized.

As part of sprint 0 the definition of ready and definition of done, must be established and the user stories for the first two sprints built out to a level of detail that can be accepted as ready. Foundation architecture strategies, testing, training and communication strategy's are established for the project.

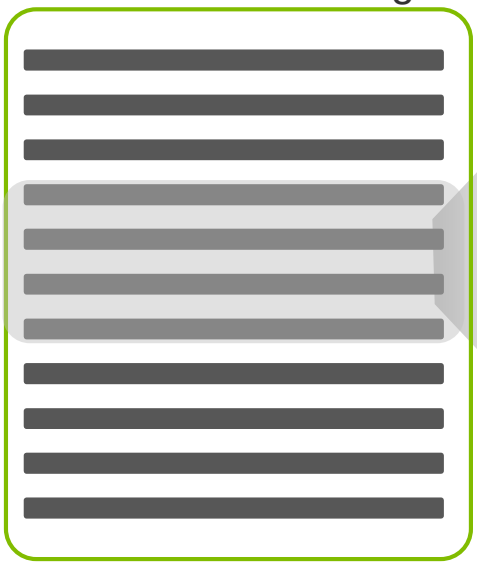


Design & Build - Sprint

A sprint represents a four week (working days) period in which the team works on User Stories from the Sprint Backlog a subset of Product Backlog with the goal of producing working software.



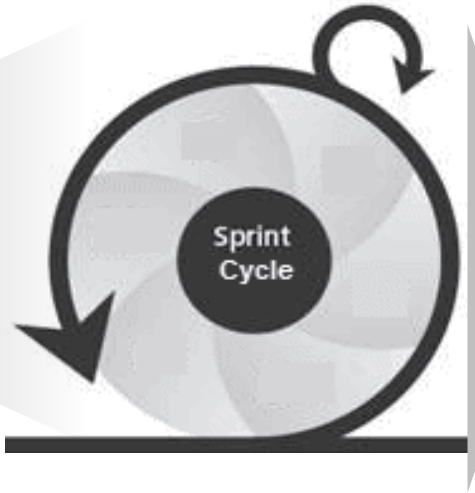
Product Backlog



The product backlog contains all of the **User Stories** in scope for the project.

Sprint Readiness

- All User Stories for the Sprint have **met Definition of Ready:**
- Acceptance Criteria
- Story Point Estimates
- High-level design
- Capacity estimation

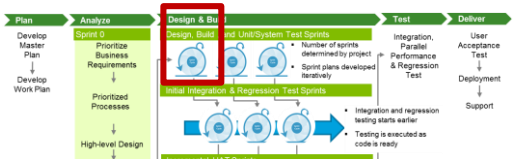


A subset of **User Stories** are selected to be worked on during a Sprint cycle with the goal of producing a working feature or capability of the software.

Sprint Review

The Sprint's features or capabilities are demonstrated and evaluated at the end of each Sprint by **End Users** and **Stakeholders** to determine if a User Story meets the defined Acceptance Criteria for that Story

Anatomy of a Sprint

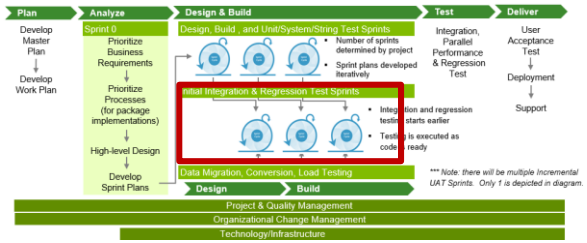


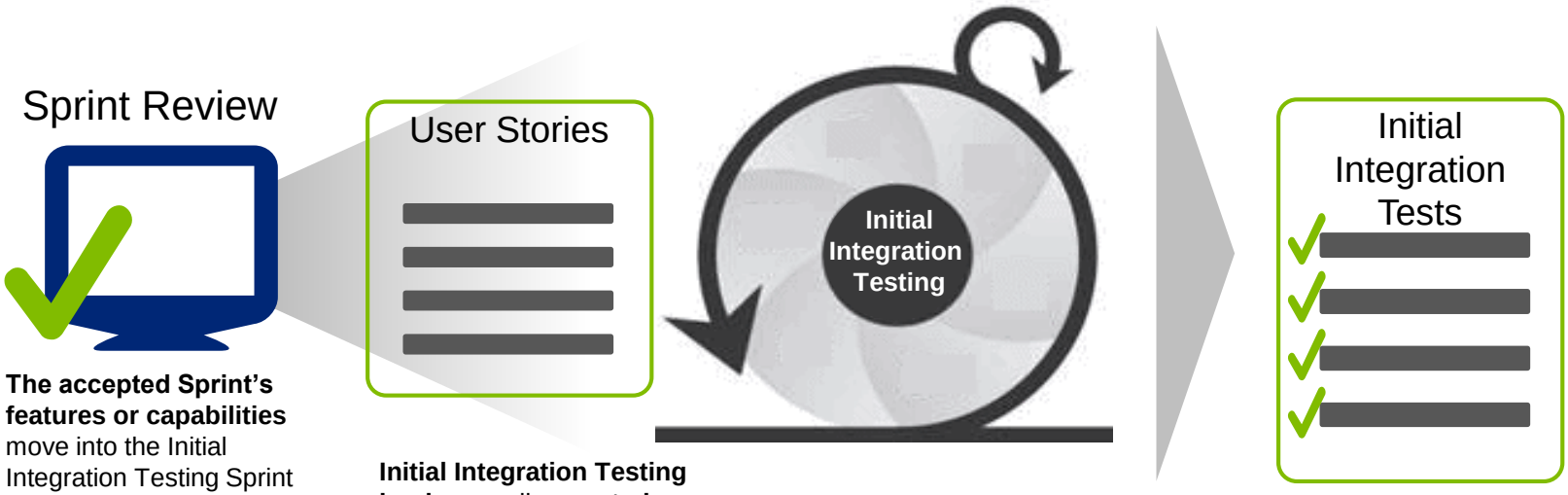
	Mon	Tue	Wed	Thu	Fri
Week 1	Sprint Planning	Standup	Standup	Standup	Standup
	Define/Assign Development Tasks	Development			
	Define/Assign Testing Tasks	Finalize Design and Specifications			
	Execute Incremental UAT (TBD assumed once every 3 sprints)				
Week 2	Standup	Standup	Standup	Standup	Standup
	Development				
	Write System Tests				Write Integration Tests
	Execute Incremental UAT (TBD assumed once every 3 sprints)				
	Write UAT Tests				
Week 3	Standup	Standup	Standup	Standup	Standup
	Development		Defects Remediation		
	Write Integration Tests		Execute System Testing		
				Design and Refinement for the following Sprint	
				Review Sprint User Stories	
Week 4	Standup	Standup	Standup	Sprint Review Session	Sprint Retrospective
	Defects Remediation				
	Execute System Testing				Product Backlog Refinement
	Review Sprint User Stories				
	Design and Refinement for the following Sprint				

DSCYF Activity Deloitte Activity Joint Activity

Design & Build – Initial Integration Testing

After User Stories are accepted (have met acceptance criteria) **at the end of a Sprint**, they will migrate to an Integration environment for initial integration testing.





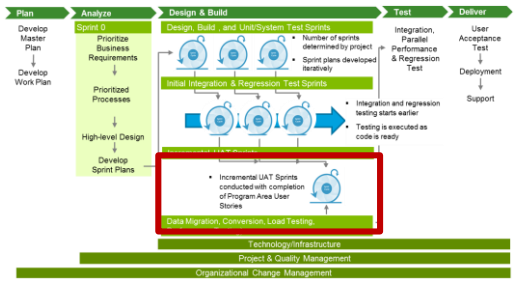
The accepted Sprint's features or capabilities move into the Initial Integration Testing Sprint

Initial Integration Testing begins on all **accepted** User Stories

User Stories have passed all **integration tests** and are now fit in with other system functionalities.

The Release – Incremental UAT

A release is a grouping of User Stories that represents a system functionality (e.g. Program Involvement). A Release is ready for Incremental UAT once all User Stories in that Release are considered “Done” and have passed Integration Testing.



Product Backlog

The product backlog contains all of the **User Stories** in scope for the project.

Release 1
User Stories

Release 1 – *YRS Detention*

User Stories will be grouped into system **functionality categories** called **Releases**. (E.g. Program Involvement)
A **Release** is “Done” when all of its **User Stories** are considered “Done.”

Incremental UAT

DSCYF will execute end-to-end **Incremental UAT** testing of the Release items to validate that the system meets the business needs for that **Release**.

Redefining Roles

The Importance of Sprint Roles

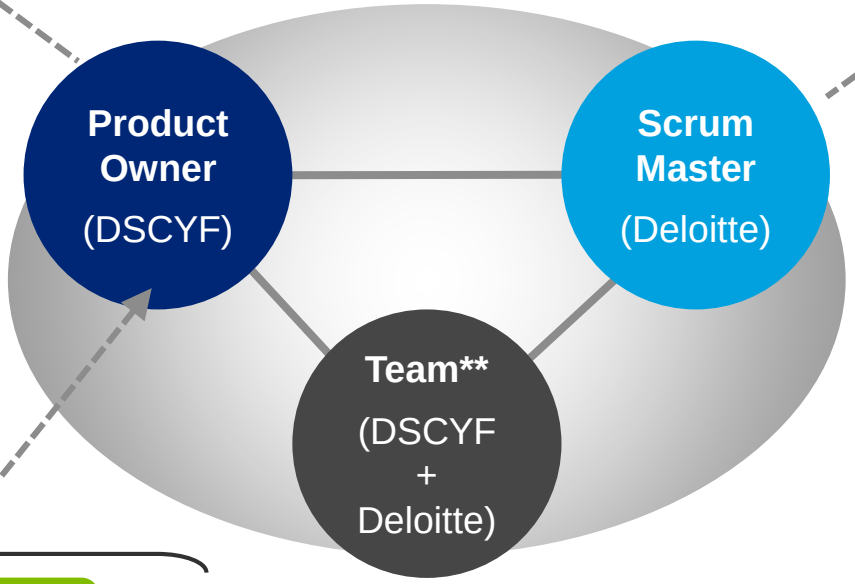
The FACTS II methodology emphasizes the importance project roles – Product Owner, Scrum Master, and Team and includes steering and oversight from the executive team.

Executive Product Owner

- **Client voice** and accountable for product success
- Attends Daily Stand-Up Meetings
- Works with Scrum Master to clear impediments
- Defines high-level product features and priority of user stories working with stakeholders
- Manages the **Product Backlog**
- Ensures user stories and acceptance criteria are what end-users need
- Attends Sprint Reviews
- Ultimately decides if every **User Story** in the Sprint Review **meets the Acceptance Criteria**

DSCYF Project Management | **Deloitte Project Management**

Executive Scrum Master



- **Servant Leader** – enables close cooperation across all roles/functions
- Facilitates daily 15 minute team meeting (**Daily Stand-up**)
- Maintains **Sprint Burn Down Charts**
- Manages **Impediments** identified by the team
- **Protects** team from distractions

SMEs | **Primary Client Stakeholder**

Stakeholders

- Cross-functional, self-managing, 5-9 members
- Performs the tasks of delivering the product
- Team defines own tasks and assignments
- Maintains own **Sprint Backlog**
- Conducts **Sprint Review**

** team roles defined in following slides

Roles & Events
Mapping responsibilities

Phases, Events & Activities Require Consistent Involvement

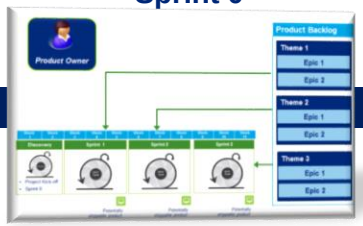
Sprint 0

PMO Deliverables

Sprint 0

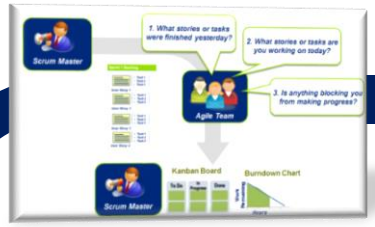
Define Themes, Epics and User Stories Product Backlog.

Sprint 0



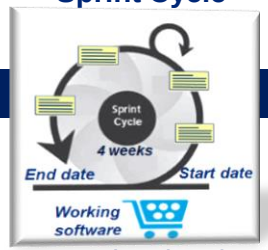
Develop Master Plan including Themes, User Stories, and Releases

Sprint Cycle



Conduct Daily Stand-up to adjust to achieve the completion of the Sprint Backlog.

Sprint Cycle



Team works closely with Product Owner to complete User Stories in Sprint Backlog

Sprint Cycle

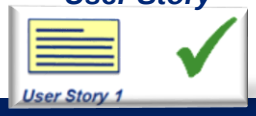
Conduct Sprint Planning to assign User Stories from Product Backlog to Sprint Backlog. Finalize Definition of Done for User Stories

Next Sprint

Sprint Cycle

Conduct Sprint Review to demonstrate working software to Product Owner and Stakeholders

Approved User Story



Rejected User Story moved to Product Backlog

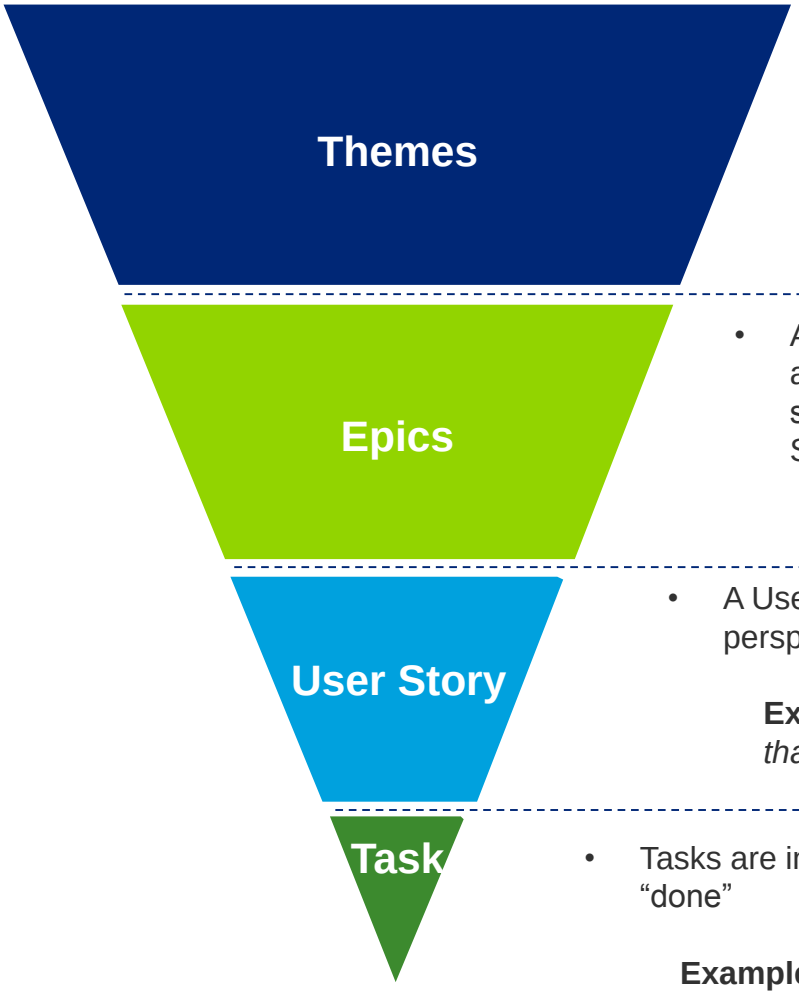
UAT Release

Working Software deployed to UAT Testing Environment

Sprint ends with Sprint Retrospective to discuss lessons learned

Breakdown of Product Backlog Items

Overview



- A Theme is a top-level objective that may span projects and products. Themes may be broken down into sub-themes, which are more likely to be product-specific. At its most granular form, a Theme may be an Epic

  Example: *Personalize user experience*

- An Agile Epic is a group of related User Stories, representing a feature. You would be unlikely to introduce an Epic into a sprint without first breaking it down into it's component User Stories so as to reduce uncertainty

  Example: *Allow users to create user profiles*

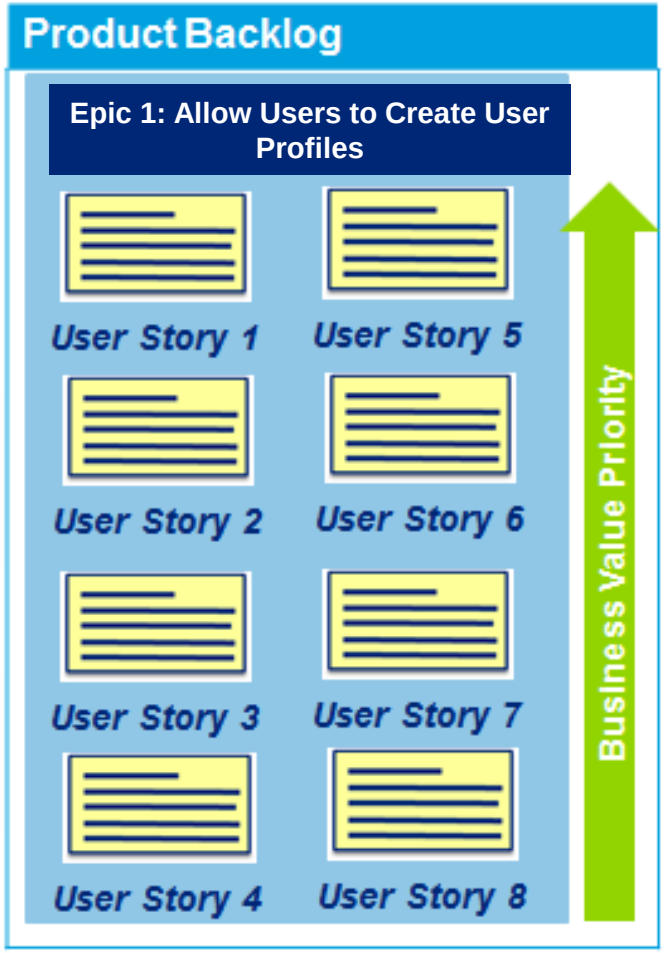
- A User Story is a description of desired functionality told from the perspective of the user

  Example: *As a registered user, I want to reset my password so that I can login into the site if I forget my password*

- Tasks are individual activities that are required for a User Story to be "done"

  Example: *Author acceptance test for User*

What is a Product Backlog?



An ordered list of requirements

Contains features, functions, requirements, enhancements, defects, etc.

Dynamic and constantly changing

Ordered by the Product Owner

Discovery – Product Backlog

At the beginning of the project, the **Product Owner** works with the primary client stakeholder to identify Epics and User Stories which are grouped together to create **Themes** for the **Product Backlog.**

Executive Product Owner

Product Owner

Primary Client Stakeholder

What are our high-level business requirements?

Product Backlog

Theme 1: Personalize user experience

Epic 1
Allow users to make FACET Intake

Epic 2
Allow users to make PSSF Intake

Theme 2: Increase traceability of clients

Epic 3
Allow users to have clients in multi-division program involvements

Epic 4
Allow providers to be involved in multi-divisional services

Creating Well Defined User Stories

A user story:

- Is a basic unit of work representing some business value that can be delivered within a sprint
- Includes enough detail to enable the project team to make planning decisions
- Consists of one or more sentences used to describe user needs and act as a placeholder for a conversation
- Captures the “who”, “what”, and “why” in a simple and concise way
- Is used to describe requirements for different users (personas)

As
The system user or the persona who will be using this story

I want to
Achieve a goal as a result of using the system

So that
Tangible benefits that will be realized after using the system

Sample User Story Template

1

Story Title					
MVP #:		Story ID		Estimate (story points)	

2

Story Summary	Users/Personas and Systems Involved
3 *As a… I want… So that…*	4

Acceptance Criteria	Free Drawing
5 *Acceptance Criteria 1* *Acceptance Criteria 2* *Acceptance Criteria 3*	6

7

Supported Scenarios			
Given	*<Precondition 1>*	***Given***	*<Precondition 1>*
AND	*<Precondition 2>*	*AND*	*<Precondition 2>*
When	*<Trigger Event 1>*	***When***	*<Trigger Event 1>*
AND	*<Trigger Event 2>*	*AND*	*<Trigger Event 2>*
Then	*<Result 1>*	***Then***	*<Result 1>*
AND	*<Result 2>*	*AND*	*<Result 2>*

8

Assumptions / Risks / Unknowns	

Required

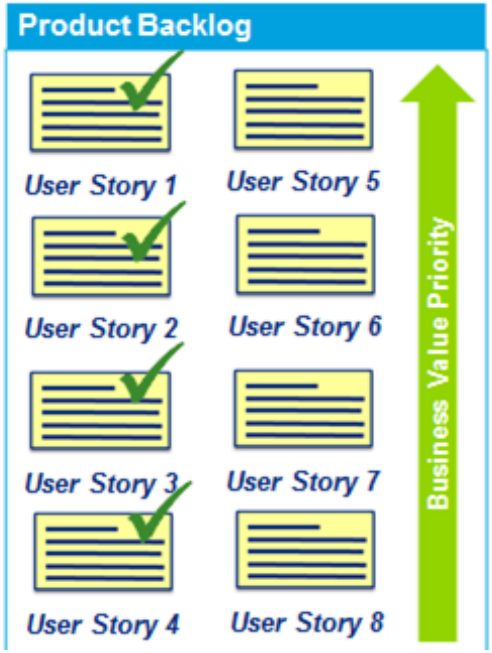
Optional

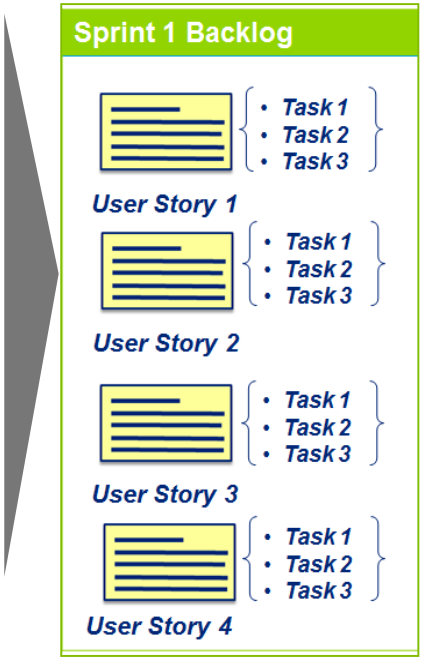
Sample User Story Template Guidelines

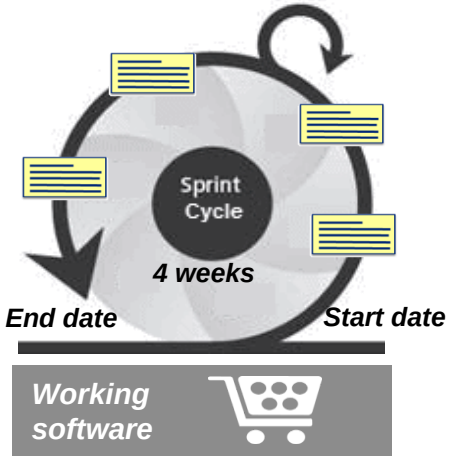
1	Enter the Story Title, MVP, and Story ID, and refine the Story Title as the User Story evolves to reflect what it is
2	Enter the estimate in story points to deliver the User Story as decided by the team in an estimation session just in time for the story to enter the sprint
3	Put the User Story into a high level structure soon after the story has been identified (through Story Mapping). This should happen early in a story's life during Product Backlog Refinement (PBR) but should be refined as the story becomes more definite and better understood
4	Identify the Users relevant to the User Story including any Personas created by the team and Systems involved in the User Story development. This can happen early in a story's life but should be refined as the user group becomes more defined and the system context better understood
5	Define Acceptance Criteria for the User Story while trying to keep the story as simple as possible (treat each criteria as additional scope and therefore potential complexity and increased time to deliver). This should happen during PBR and these criteria should be refined as the story becomes more definite and better understood
6	*Optional*: Create a visual representation to help convey what the User Story is about; it could be a UI mockup, a system interaction diagram, a decision tree, etc.. This can happen throughout a story's life as the team tries to think through the requirement and uses visualization techniques to do so
7	Elaborate the scenarios that the User Story needs to support in order to start fleshing out the requirement and giving the team the detail needed to estimate. This would include any 'happy path' and 'exception' scenarios and should happen (and be refined) during PBR and be completed just in time for estimation
8	*Optional*: Track any assumptions, risks or unknowns that come up in relation to the User Story that the team needs to validate, address, or resolve. This can happen through a story's life as the team explores the story

Sprint Cycle – Sprint Planning & Sprint Backlog

At the beginning of every Sprint, the **Scrum Master** facilitates a **Sprint Planning** meeting with the team and Product Owner to validate the User Stories, estimate any stories not previously estimated and assign to the **Sprint Backlog** based on size and priority. This allows the teams to accurately adjust based on capacity and velocity. Executive Scrum Master provides support if needed.





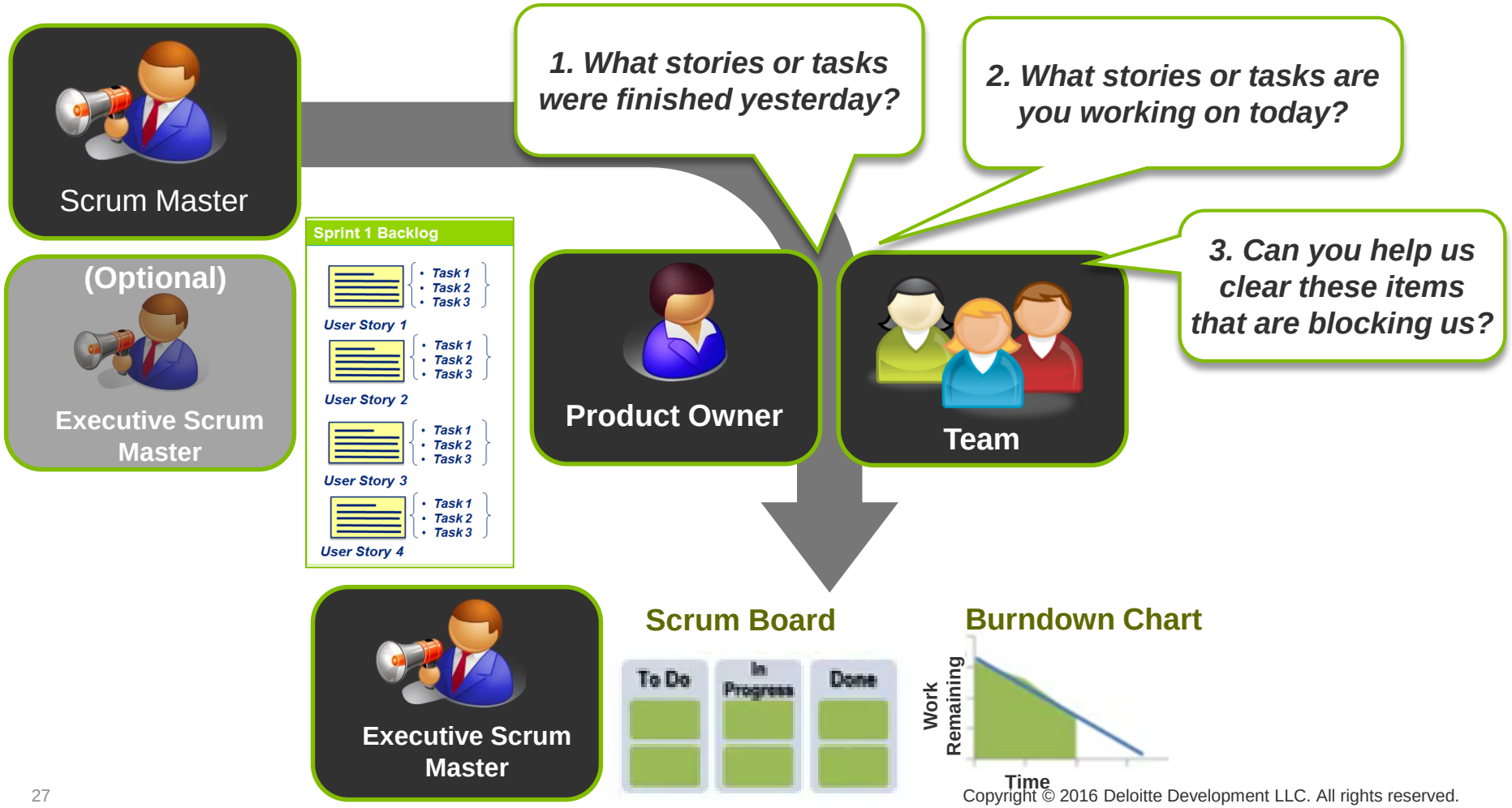


Team responsibilities:

- **Self-assigns & commits to tasks**
- Breaks down each user story into tasks
- Decides when capacity met for Sprint and Sprint Backlog is filled

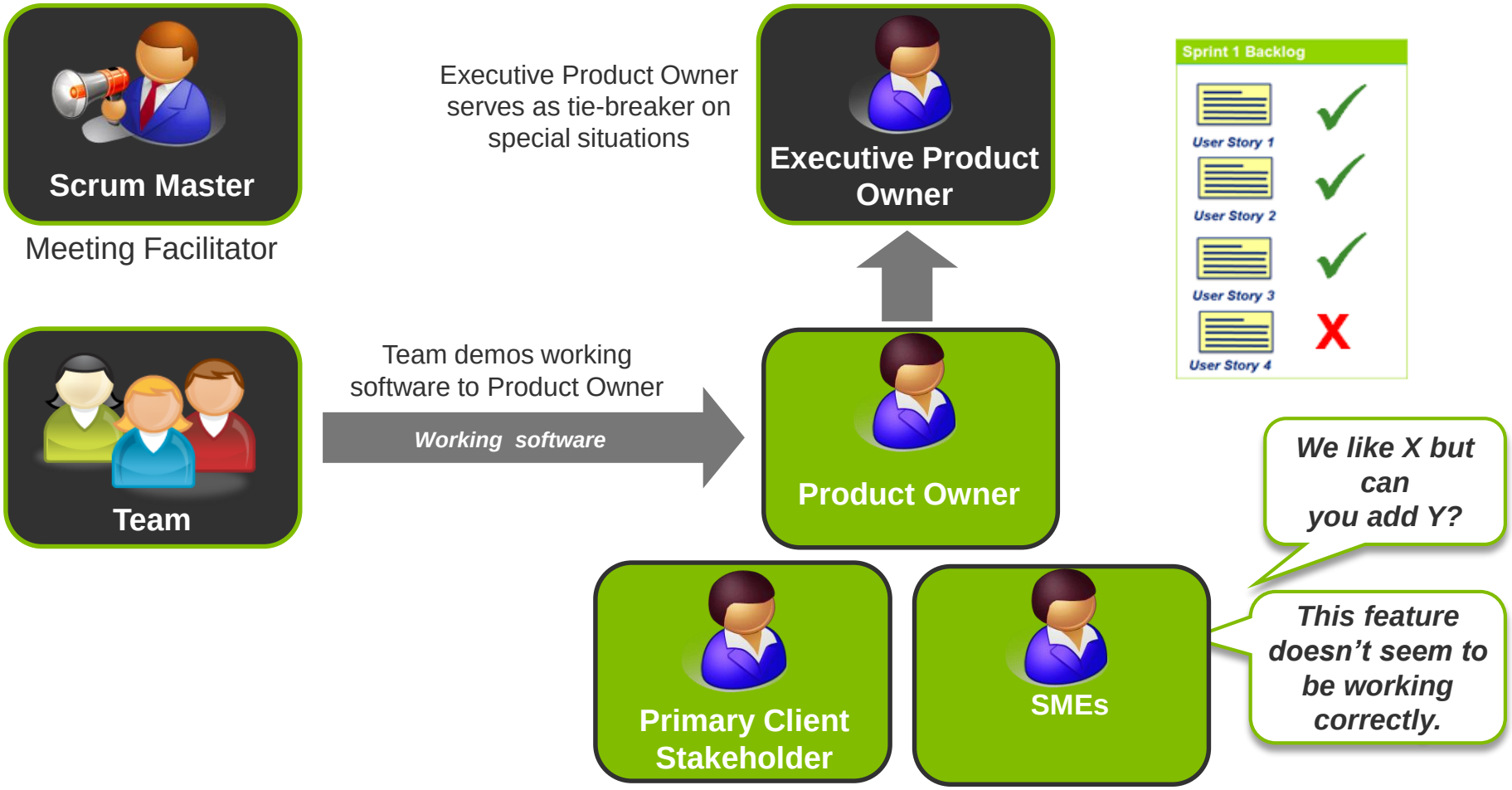
Sprint Cycle – Daily Stand-up

Everyday during the Sprint, the **Scrum Master** facilitates the **Daily Stand-up** with the **Team and Product Owner** to discuss and assess Sprint progress. For projects containing multiple scrum teams there will also be a scrum or scrum meeting.



Sprint Cycle – Sprint Review

At the end of the sprint, the **team demonstrates** working software to the Stakeholders, Product Owner, and SMEs and **gathers feedback.** The **Product Owner decides** if each **User Story** in the Sprint Backlog **meets the Acceptance Criteria for the given User Story**



Sprint Cycle – Sprint Retrospective TEAM ONLY

To conclude the sprint, the **Scrum Master** facilitates a **Sprint Retrospective** with the **team** to discuss lessons learned and identify best practices. This is an internal team event that facilitates open and honest progressive growth.

Fewer stakeholders should be invited to the Sprint Review.

We need to better define our user stories.

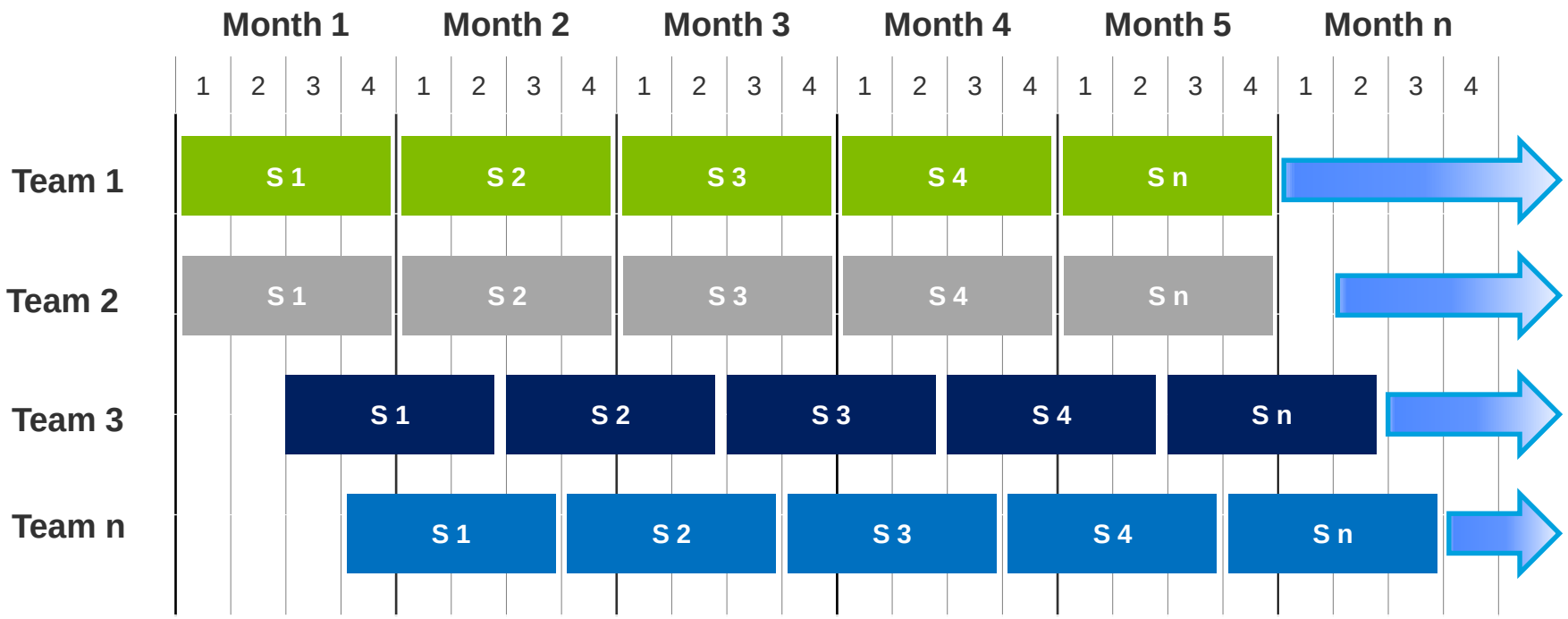
I think we need to have 4 week sprints.

I think Daily Stand-up should be in the morning.

Sample Sprint Structure

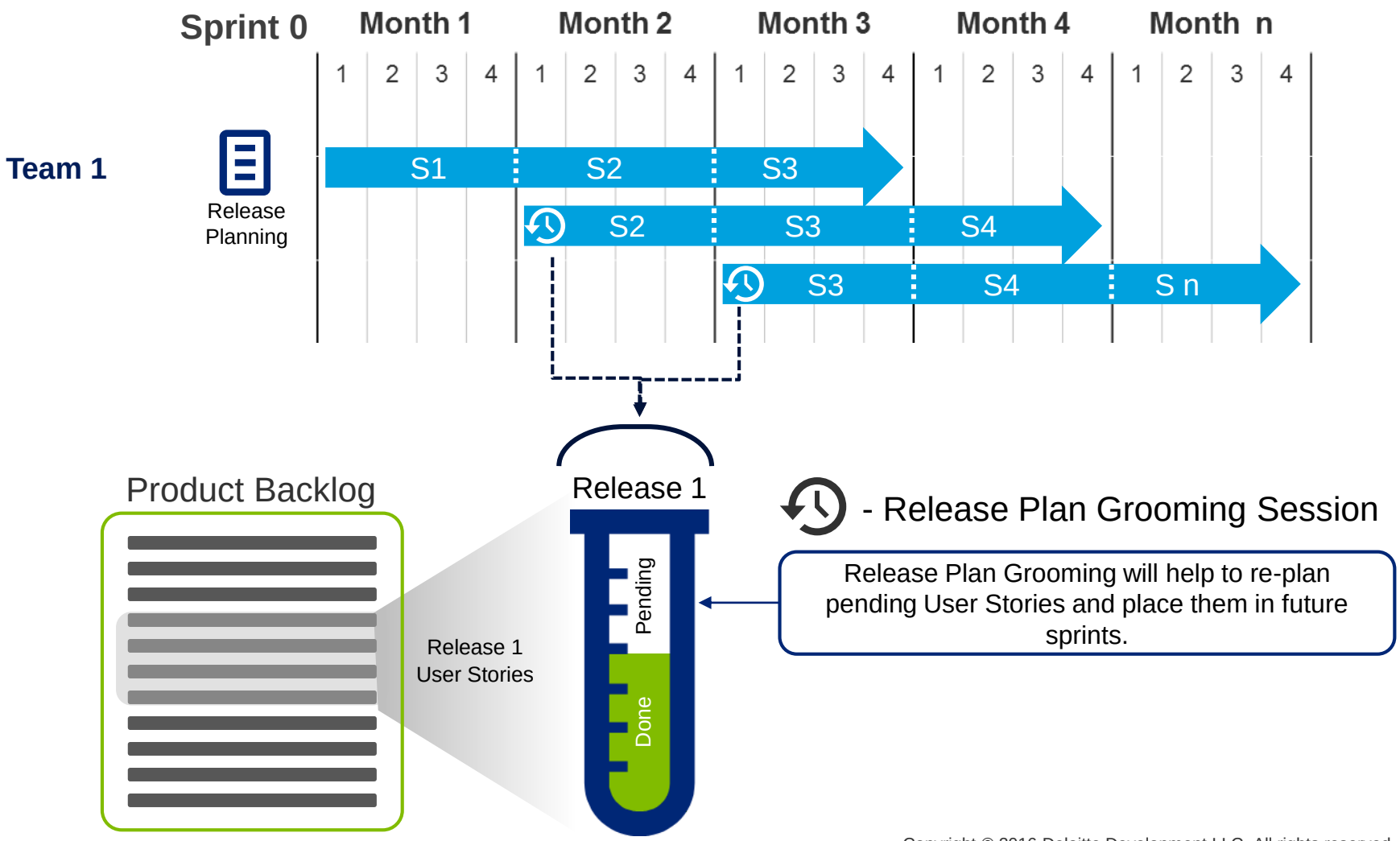
A Staggered Sprint Schedule

Staggering sprints distributes the client's availability to work with different functional teams during each sprint. This way, the client can focus on sprint activities for different functionalities one week at a time.



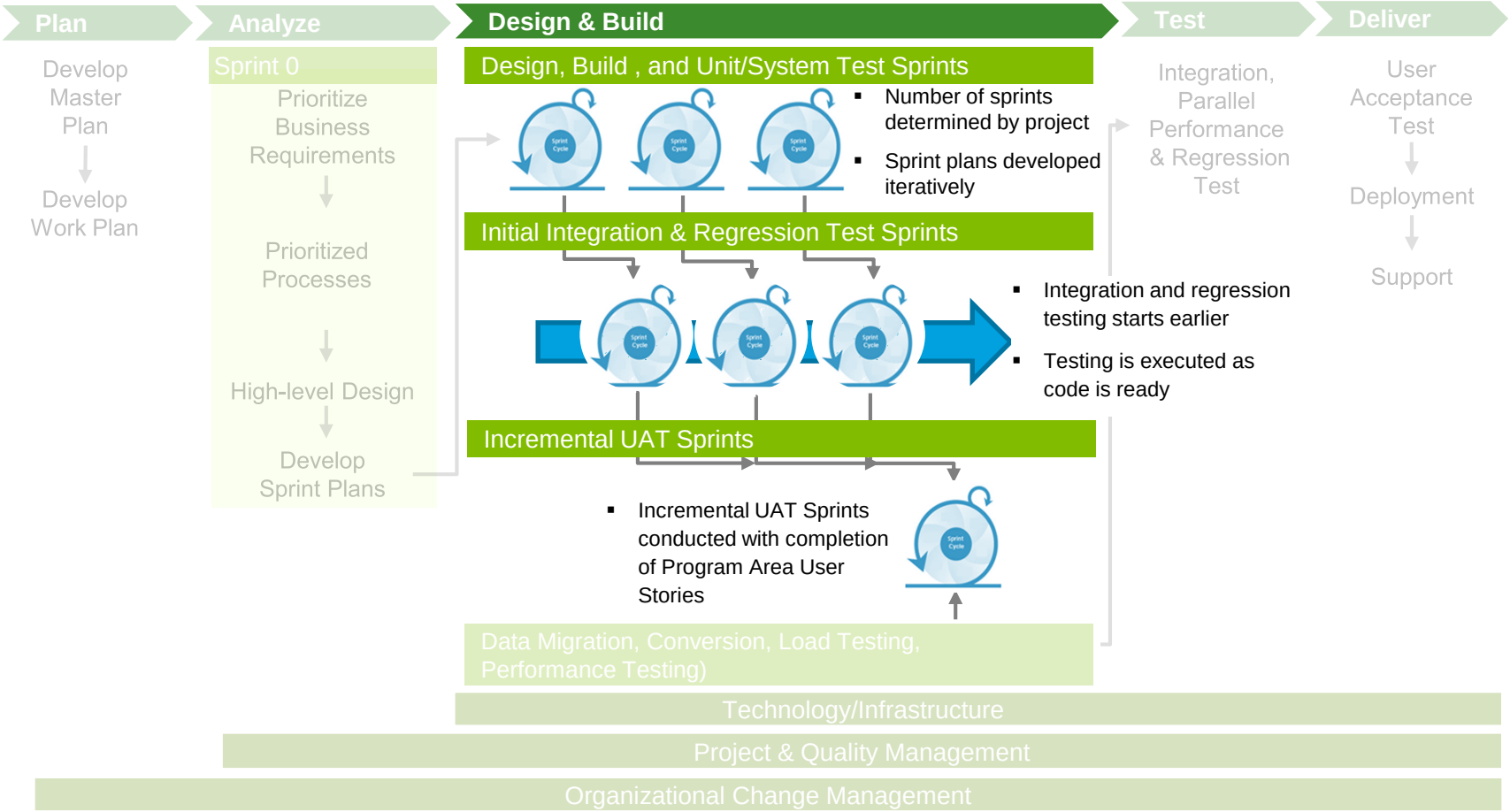
Release Plan Grooming – 3 sprints in advance

Release Planning will be completed during Sprint 0. Each Sprint Team will do Release Plan Grooming at the end of every sprint in order to defer pending User Stories to future sprints.



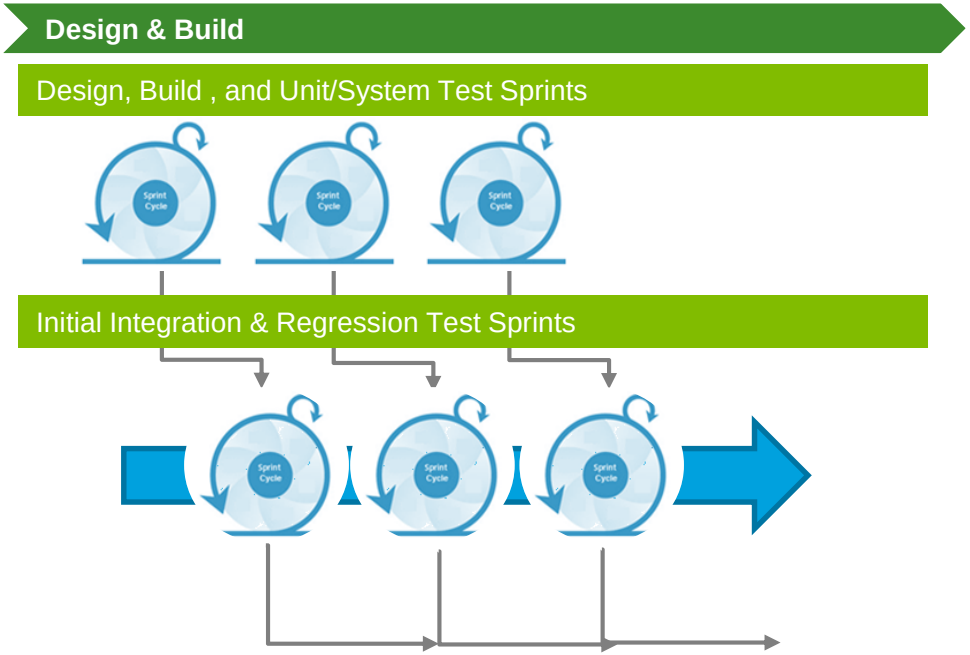
Testing

FACTS II Hybrid-Agile Test Framework



FACTS II Hybrid-Agile Test Framework

Unit, System, Integration, and Incremental UAT testing.



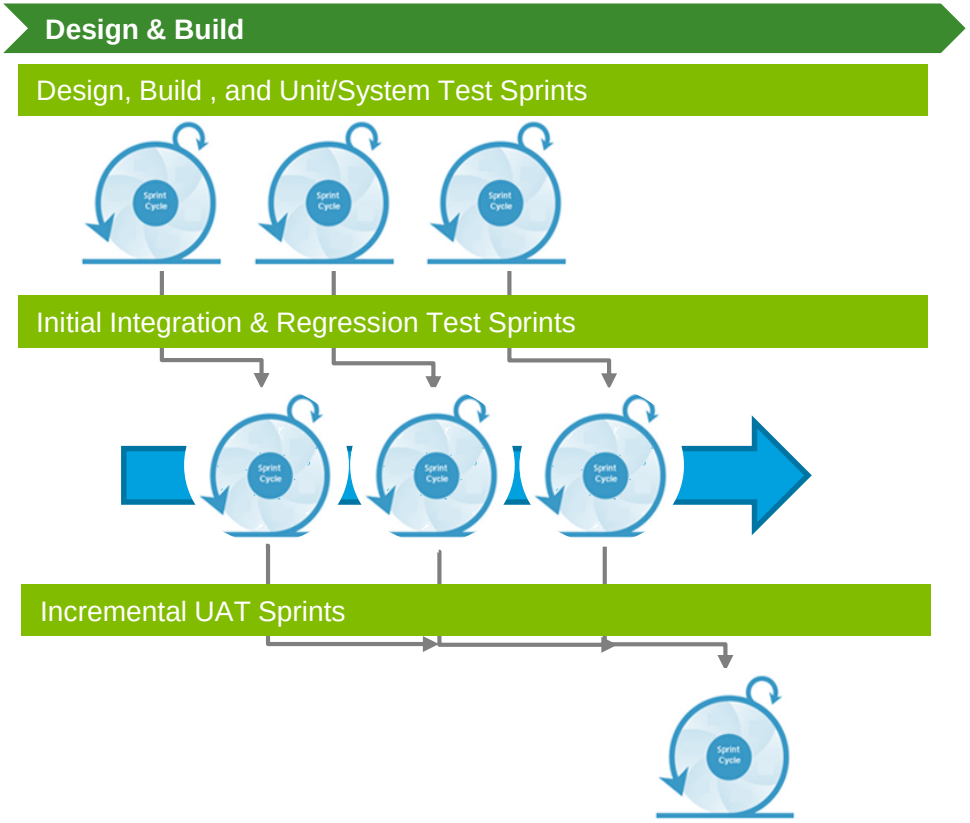
Unit Test – Run manual and automated unit tests several times a day on affected code to cut down on defects at the local environment.

System Test – Run System tests to ensure the system functionality meets the business requirements, including alternate flows, and is ready for the sprint review.

Initial Integration Test – We will run initial integration tests to validate the end-to-end flow of business requirements within the use cases, including alternate flows.

FACTS II Hybrid-Agile Test Framework

Unit, System, Integration, and Incremental UAT testing.



Unit Test – Run manual and automated unit tests several times a day on affected code to cut down on defects at the local environment.

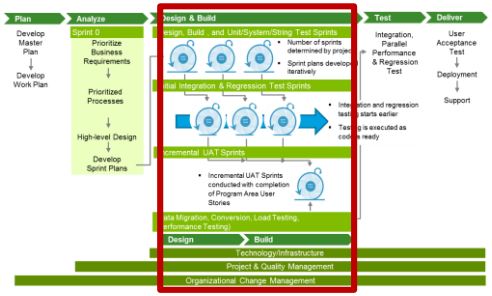
System Test – Run System tests to ensure the system functionality meets the business requirements, including alternate flows, and is ready for the sprint review.

Integration Test – We will run integration tests to validate the end-to-end flow of business requirements within the use cases, including alternate flows.

Incremental UAT – DSCYF will execute the UAT test cases designed by the Product Owner.

Testing Approach – Test Scripts

Deloitte and DSCYF will each write and compare their corresponding test scripts to ensure proper testing of each requirement.



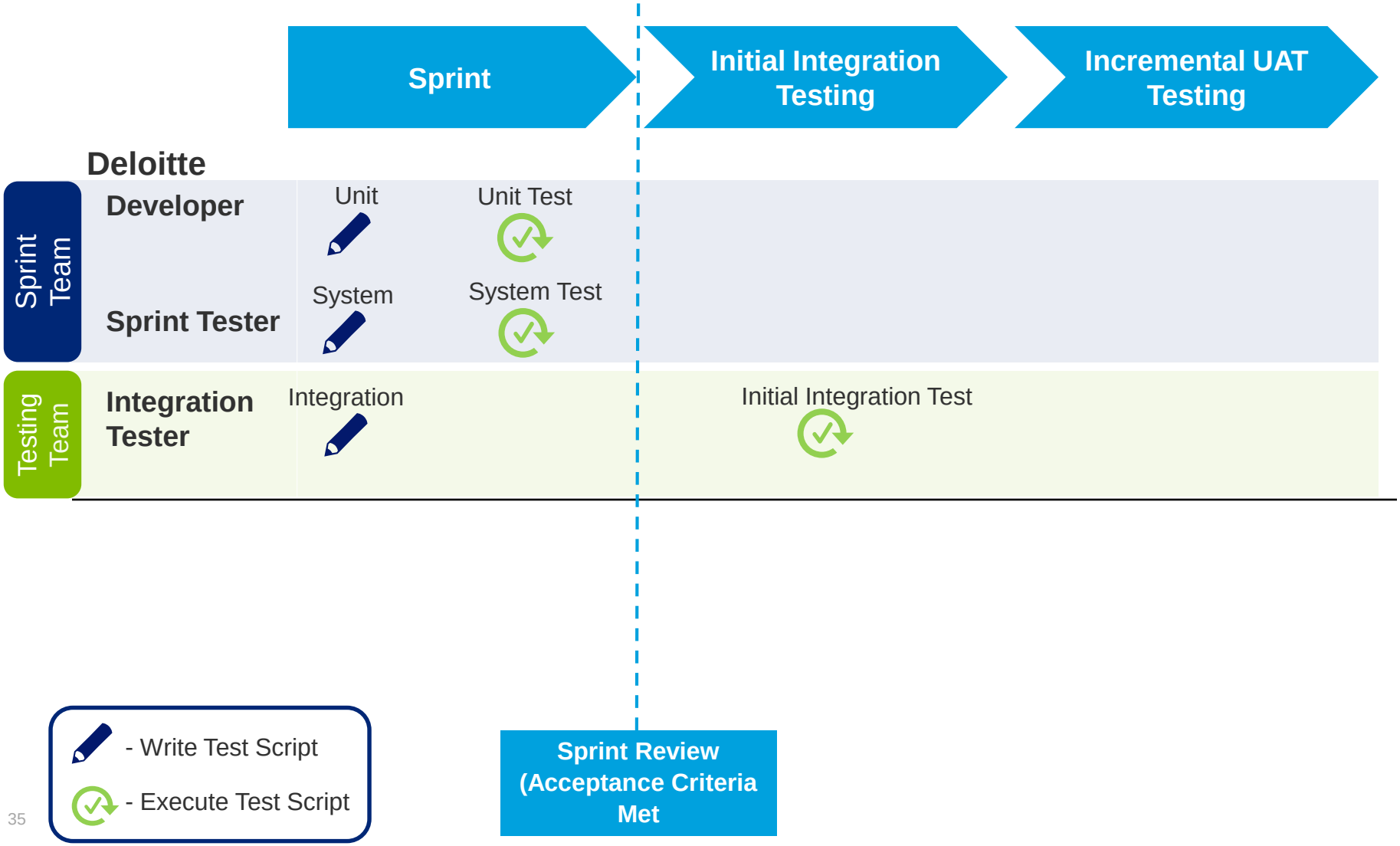
		Sprint	Integration Testing	Incremental UAT Testing
Deloitte				
Sprint Team	**Developer**	Unit Unit Test		
Sprint Team	**Sprint Tester**	System System Test		
Testing Team	**Integration Tester**	Integration	Integration Test	
DSCYF				
	Product Owner	Incremental UAT		Incremental UAT

Sprint Review (Definition of Done)

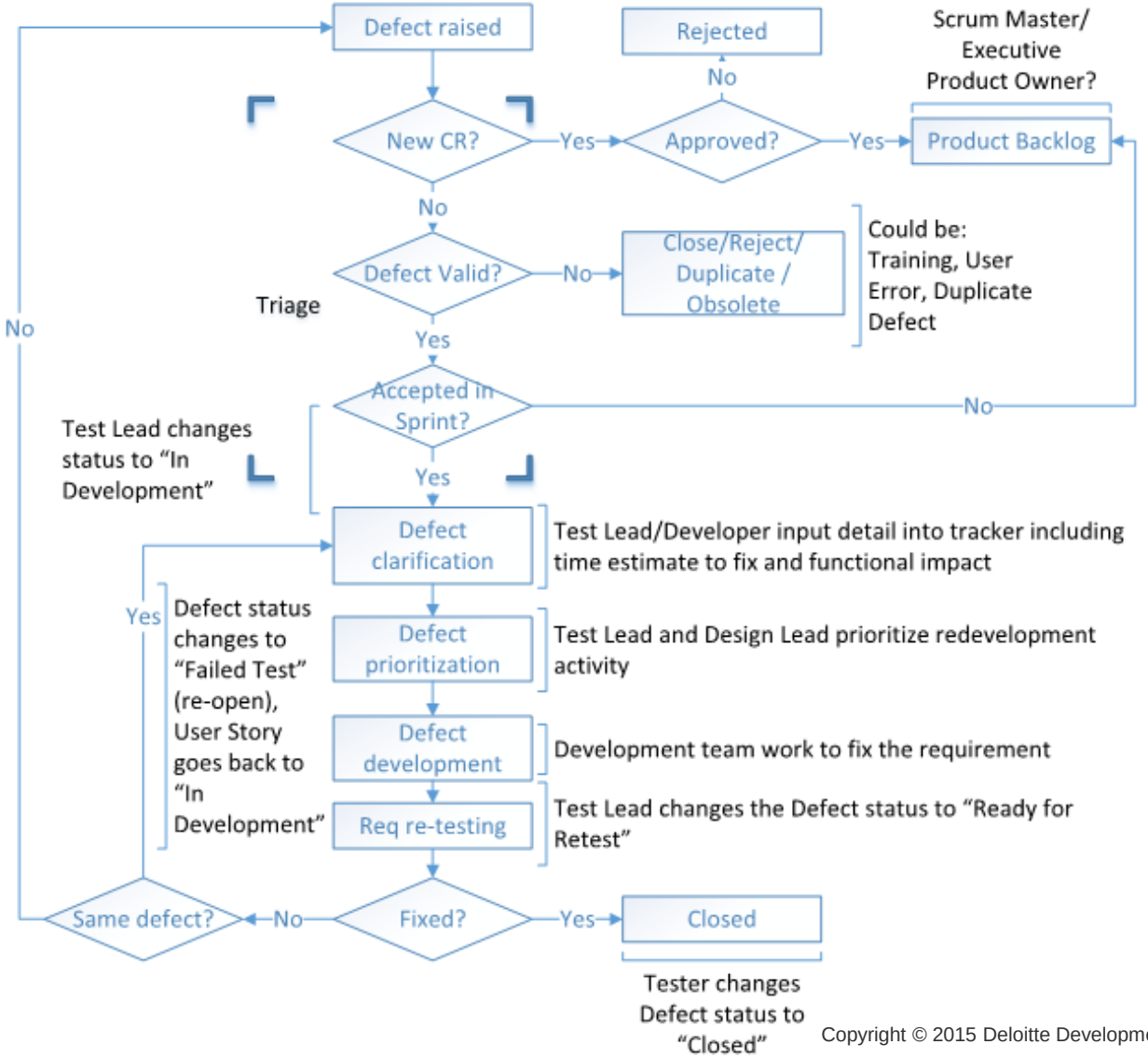
- Write Test Script
- Execute Test Script

Testing Approach – Test Scripts

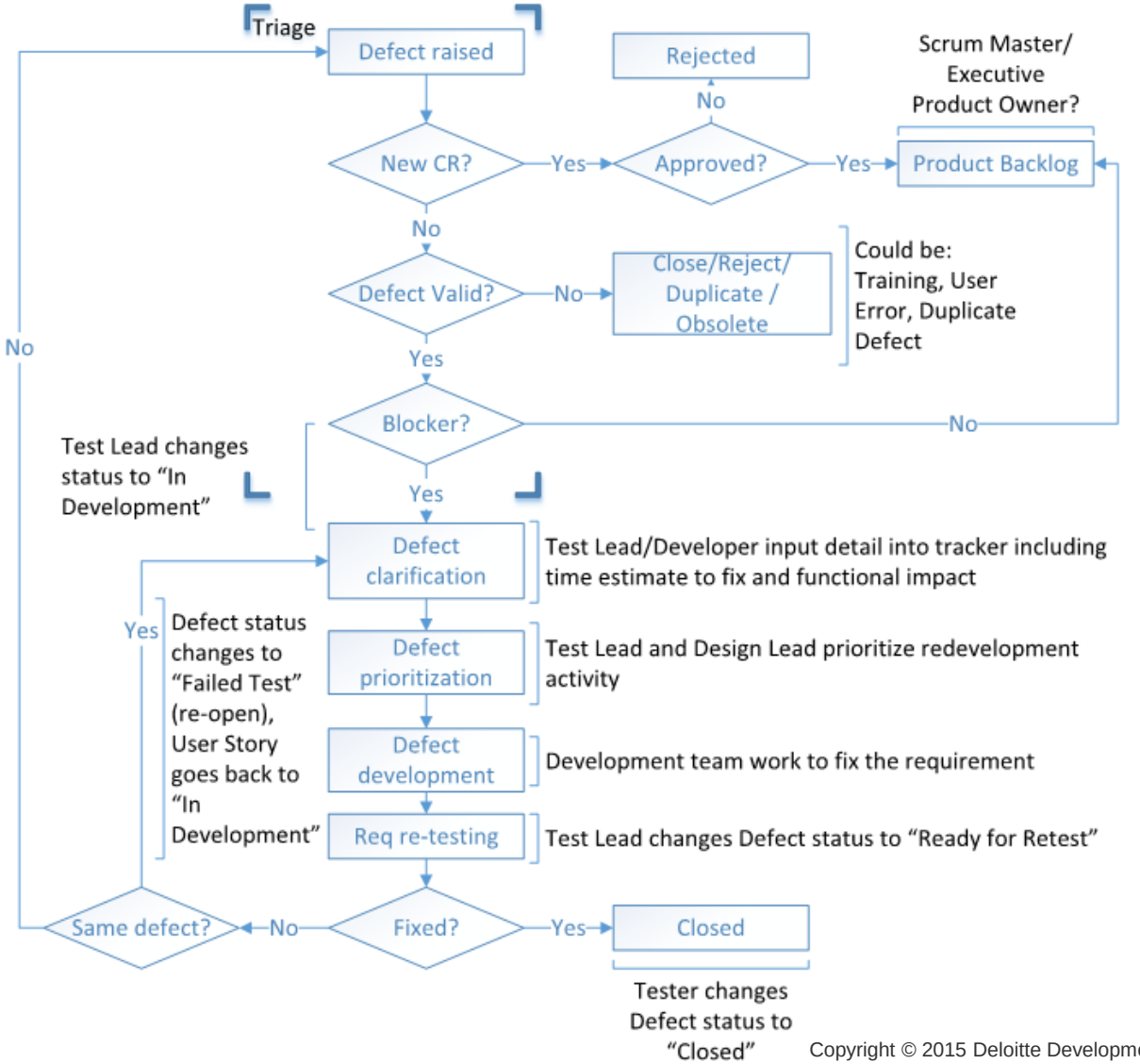
Deloitte and DSCYF will each write and compare their corresponding test scripts to ensure proper testing of each User Story.



Testing Approach – Defect Lifecycle Management within a sprint



Testing Approach – Defect Lifecycle Management in Integration Testing and Incremental UAT



Defect Severity –

Defect Severity is determined by the person that creates a defect and measures the degree of negative impact on the quality of software. Severity is applied to integration and UAT testing

Severity

S4

- **Definition:** Cosmetic or trivial errors.
- **Examples:** visual changes (color), screen wording (internal)

S3

- **Definition:** Functionality missing on a screen. Workaround available.
- **Examples:** A simple business rule or validation missing on a screen.
  - "Error Message is not in sync with design spec."

S2

- **Definition:** Incorrect functionality and no acceptable workaround available. Stops Testing.
- **Examples:** "Failed test case because drop-down does not display values, therefore cannot continue."

S1

- **Definition:** Any fatal error preventing the user to complete a transaction. Stops Testing.
- **Examples:** "Page crash on click of 'save' (ContractDocuments.aspx)"

Defect Priority

Defect Priority refers to the importance of a defect from a business value perspective as evaluated by the development team.

Level	Definition	Action
1 – Urgent	• Defect affects the application severely	• Fix immediately • Must be fixed before sprint cycle is complete
2 – Medium	• The defect is not urgent yet still impacts the application's functionality	• Fix in normal course of activities • Should be fixed during sprint cycle but could be deferred to future sprint
3 – Low	• Defect is irritant but does not affect key application functionality	• Can wait until after more serious defects have been fixed

Defect Categorization Example Matrix

Priority →

Severity ↓

• Any spelling mistake within a paragraph or report (not in title, heading, logo, etc)	• Spelling mistake on application title, cover page, logo
• Application crash preventing a workflow happening on a screen that is rarely used	• Application crashes on frequently used screens • Defect that severely corrupts environment data

Test Data Management

The project will follow a Test Data Management guideline to set rules for Governance, Test Data Sourcing, and Data Refreshes.

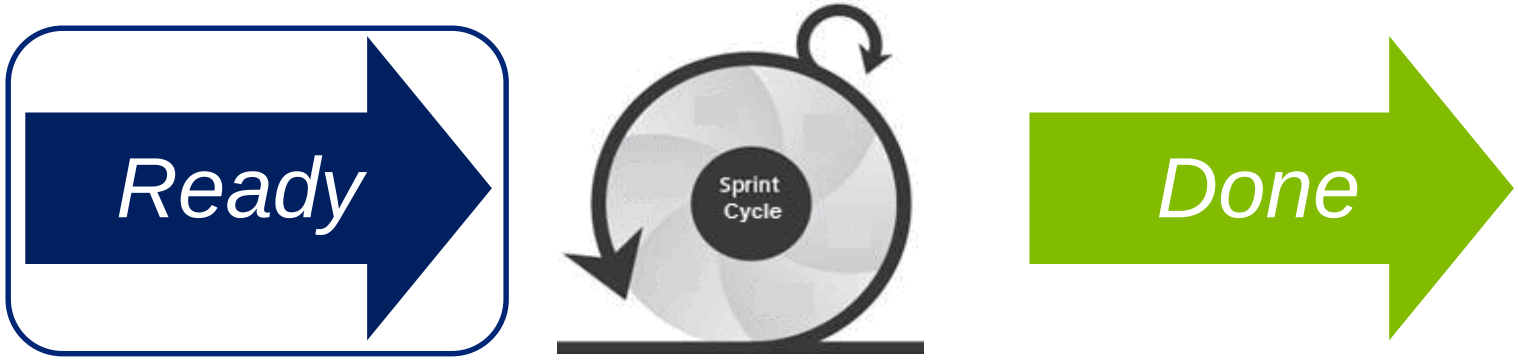
	Sprint Environment	Integration Testing Environment	Incremental UAT Environment	UAT Environment
Governance	Shared Ownership between Deloitte Development and Testing team	Deloitte Testing Team	DSCYF	DSCYF
Test Data Source	Manually keyed Data as per test case requirements	Data from Excel sheets or DB Scripts and manual as per the test case requirements	Data from Excel Sheets or DB Scripts as per the test case requirements	Converted Data
Refresh Schedule	On Demand	On Demand	On Demand	To be agreed in Sprint 0
Refresh Schedule Details	1. After defect fixes that caused data corruption 2. Before conducting sprint demos 3. When a new table is added to the schema	1. After defect fixes that caused data corruption 2. When a new table is added to the schema 3. After testing team is finished testing and asks for a refresh	1. After defect fixes that caused data corruption 2. After client testing team is done testing and asks for a refresh when required	1. After defect fixes that caused data corruption 2. Refresh data after agreed period determent in conversion approach

Sprint Entry & Exit

User Story Lifecycle - Sprint Entry Criteria

Definition of Ready – the team decides if a **user story** has met the agreed criteria prior to being **accepted into a sprint**.

1. The user story is clear to all team members.
2. The user story is descriptive enough that team members will be able to identify the tasks for that story.
3. The User Story passes the INVEST check (Independent, Negotiable, Valuable, Estimate, Small, Testable).
4. Acceptance Criteria is defined, reviewed, and approved by PO/Tech lead or team.
5. User story has been sized by the team.
6. User story can be completed within the sprint according to DoD
7. Inter team and resource dependencies have been identified and resolved.
8. Team knows how to demo the user story.
9. All outstanding questions have been answered with respect to the user story.
10. User story is entered into the mutually agreed AGILE TOOL and all mandatory fields are populated.

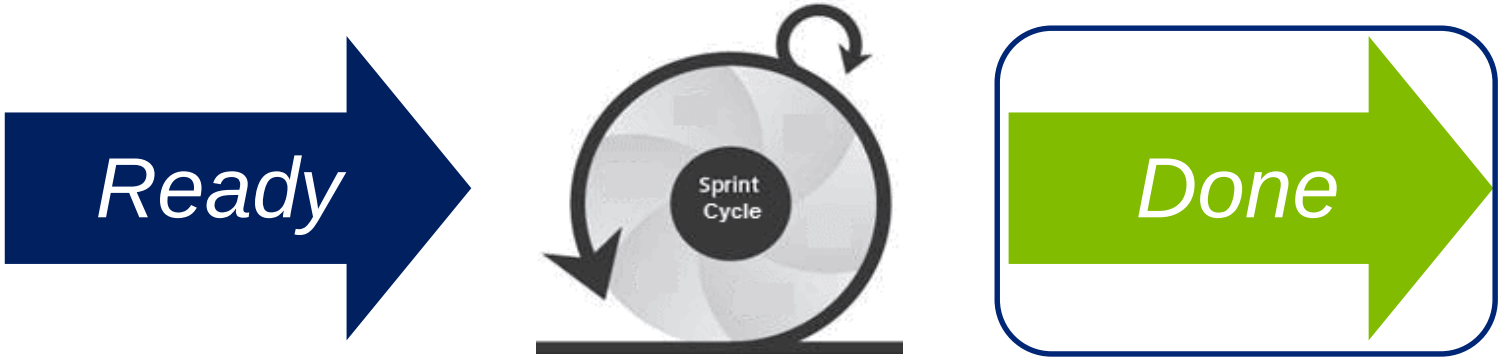


In order to accept the user story in a sprint, it must meet the INVEST criteria.

User Story Lifecycle - Sprint Exit Criteria

Definition of Done – defined during sprint 0 this serves as the criteria for the product owner to consider an item "done." It is recommended to follow the SMART criteria to decide the criteria for "done."

1. Configuration and code development for user story has been completed
2. Manual Unit/Feature test cases developed and documented
3. Manual Unit/Feature tests 100% executed and all bugs have been fixed – 100% pass
4. Deloitte QA Team Functional Tests Scripts written
5. Deloitte QA Team Feature/System testing executed for new configuration and code – 100% pass
6. Passes PO initial review and acceptance criteria outlined as part of the User Story is met



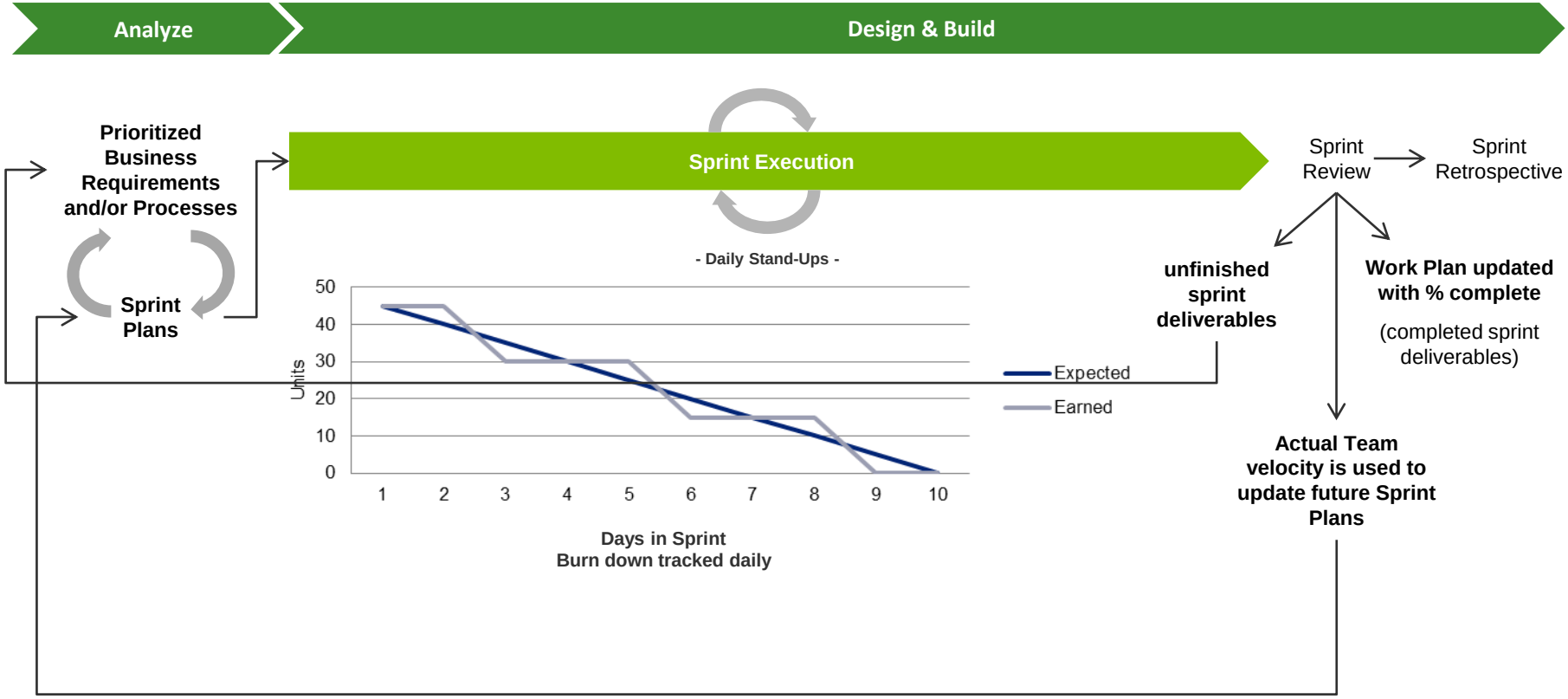
In order to accept the user story as Done by the Sprint Team, it must meet the Definition of Done criteria before it can go to Sprint Review.

Appendix

Sprint management overview

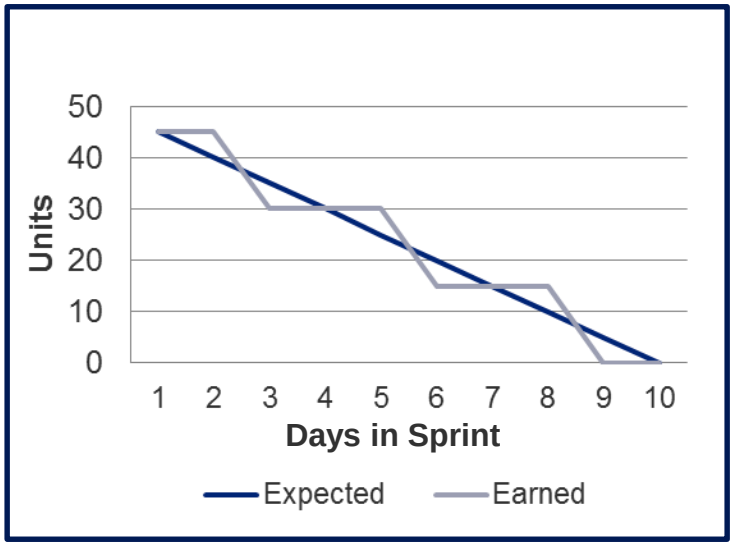
Sprints are managed via tracking of sprint burn down and the work plan is updated with % complete at the end of every sprint.

Actual Team velocity is tracked and used as an input to future splint planning



Sprint management – Tracking burn down

- Provides a visual representation of earned value over time
- Gives an earlier view into potential delivery issues
- Shows the Teams' overall progress against the sprint goals (vs % complete progress of individual deliverables)
- Is updated daily (due to the short nature of sprints) and kept visible to the entire Team



- Supports the Team working together to complete the work and reduces silos
- Requires planned effort (from PE&PS or original estimate) and remaining effort (remaining work) for each work item in the sprint
- Once the sprint is complete, the project work plan will be updated with 100% complete for all completed and accepted sprint deliverables. The completed "planned effort" represents the Team's actual velocity and will be used to update future sprint plans (if needed).